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# Designing Work:

## A study of collaboration and concentration in open-plan offices

**This article looks at the design of open-plan offices, particularly in relation to the impact of spatial design on different work-modes. It examines the history of the open-plan office, looking at how the open-plan workplace has evolved. It reports the findings of a survey on office design of 150 office workers across multiple industry sectors, job types and age categories. Finally, assuming there will not be a return en masse to the traditional, space hungry, cellular office for most knowledge workers this article considers what have we learned so far, and how spaces can be designed to support different work-modes, combining the seemingly conflicting requirements of supporting both collaboration and concentration**

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### Context

There has been much commentary recently about the negative effect of working in open-plan offices. According to a Time magazine article titled “*Workplace Woes: The ‘Open’ Office Is a Hotbed of Stress*”, “*open-plan offices sap motivation and create “cognitive load”*” (Murphy Paul, 2012). The Guardian reports that “*Open-plan offices can be bad for your health*” (Landau, 2014) while the BBC reports a “*decline of privacy in open-plan offices*” (Kellaway, 2013). According to the Washington Post, “Google got it wrong” and “*The open-office trend is destroying the workplace*” (Kaufman, 2014). There are even claims of the devil’s involvement with the BBC declaring that “*Open-plan offices were devised by Satan in the deepest caverns of hell*” (Burkeman, 2013) while an article on the ABC News website claims “*Proof That Open-Plan Offices Are Satan’s Handiwork*” (Farnham 2013).

The general theme of most of the aforementioned pieces is that open-plan offices have a negative or even detrimental effect on the ability to perform work that requires concentration and focus. Conversely, there is much research and commentary that points to the benefits of open-plan, such as increased communication, knowledge-sharing and better team integration.

### Introduction

Over the last 50 years the office landscape has been dramatically transformed as

organisations have moved knowledge workers en masse from cellular offices to open plan workspaces. Open-plan offices are now predominant across both the private and public sector and across most industries and job functions. While cost, technological advancements and a more mobile workforce are certainly major factors in any organisation’s adoption of open plan, well-designed “*collaborative workspaces*” are frequently credited with driving innovation and productivity through better communication and knowledge sharing, breaking down of silos, fostering staff engagement and team cohesion and increased creative interaction.

While there is relatively little dispute that open-plan workspaces can enhance collaboration, an increasing amount of commentary and research describes the negative effects on other work modes. In particular, poorly considered open plan office layouts have been shown to have a negative effect on activities that require focus, concentration and contemplation, such as reading and research. A 2013 study conducted by architecture practice Gensler showed that 53 per cent of employees surveyed said they were regularly disturbed by others while trying to focus in open plan spaces (Gensler, 2013, p. 8) while another study found that 60 per cent of open plan workers were dissatisfied with sound privacy (Kim & De Dear, 2013, p. 22).

### Evolution of the Office: Private Office to Cubicle to Open Plan

Open-plan offices are far from a new concept. The idea of a modern, purpose-designed office came about in the late 19th century, facilitated by the use of steel girders to create large, open floor plates reducing the necessity for internal load-bearing walls that would previously have created a warren of smaller rooms. However, up until the 1960s, open-plan areas were generally seen as a place for clerical workers, secretaries and typing pools, with single tables arranged in a strict forward-facing layout, not dissimilar to a typical classroom. Open-plan was seen as a sort of office “production-line”, designed on the principals of Taylorism. Only managers and higher grade knowledge workers were allocated cellular offices, with a desk, meeting space and even relaxation/ casual meeting space.

At the end of the 1950s, German management consultancy Quickborner came up with the idea of “*Bürolandschaft*”, literally meaning “*Office Landscape*”. The *Bürolandschaft* concept looked to the opportunities of open plan space; rather than strict linear planning and hierarchical, school-like layouts, *Bürolandschaft* favoured a more random, organic and democratic floorplans that would encourage interaction and communication and ultimately help companies innovate. This concept was adopted slowly and only to a relatively small extent in Europe with most offices retaining more traditional layouts.

In the US, “*Action Office*”, a furniture system designed by Robert Propst for US Furniture manufacturer Herman Miller was launched in the early 1960s. Action Office was the first office “cubicle” system and was designed following extensive research into office work and information flows with the intention of providing more privacy to typical open plan workers such as clerical staff, with the purpose of reducing distraction and increasing productivity. In practice, however, as real estate in major urban centres became increasingly expensive the invention of the cubicle facilitated a mass move of knowledge workers from cellular offices to open-plan. By providing a level of privacy and personal space within a large open space, the cubicle was seen as an acceptable workspace for the

increasing knowledge workforce.

The Cubicle has become much maligned; according even to its creator Propst, “*The cubicizing of people in modern corporations is monolithic insanity*” (Lohr, 1997). The cubicle provided workers with a walled-off personal space, attempting to replicate a cellular office but on a much smaller scale (Figure 1). Cubicle walls, usually at 5ft (150cm) high, were intended to provide both acoustic and visual privacy. In practice, however, many workers reported feeling self-conscious and observed as they knew they were surrounded and could be overheard by others but couldn't actually see them – a working condition reminiscent of Foucault's “*panoptic*” observation, where prison inmates are detained in one-way glass cells, never knowing whether they are being observed or not. From an information/ knowledge flow point of view, the cubicle did nothing to improve workplace communication, with workers now required to phone (or later email) colleagues who they had no visibility of but who may only be a couple of “*cubes*” or aisles away. According to Francis Duffy, founder of DEGWA, an architectural practice specialising in workplace design, cubicles,

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Figure 1: Typical office cubicle Layout

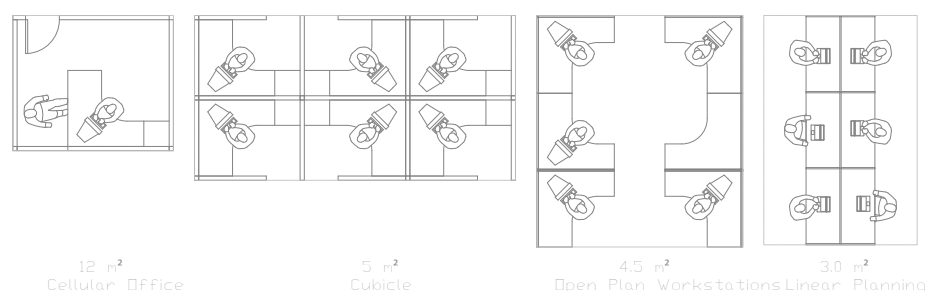


Figure 2: Evolution of the office

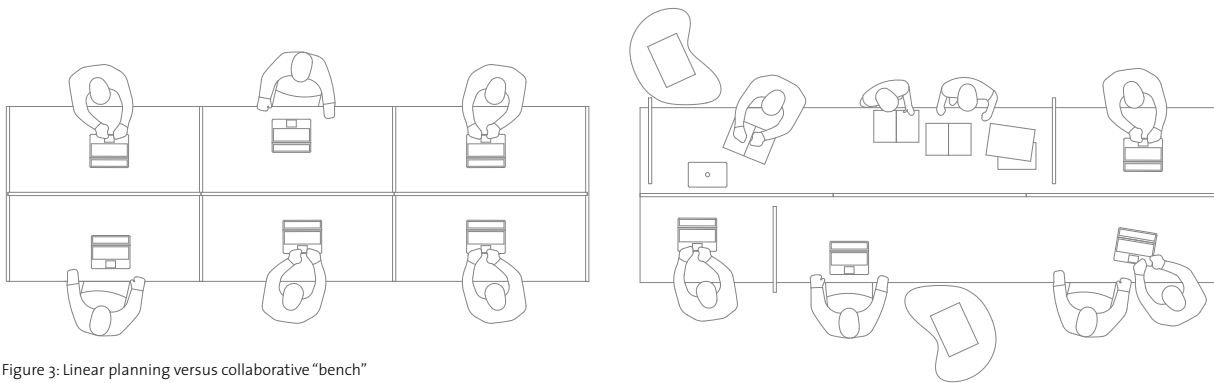


Figure 3: Linear planning versus collaborative "bench"



Figure 4:  
8080 Bench System Designed by John Walsh

often referred to as "pig-pens", were a poor compromise describing them as *"a disease, a pathology of the office.... It doesn't give you privacy, it doesn't give you control over your environment"* (Kremer, 2013).

### New Ways of Working

A reaction to the inward looking isolation of the cubicle is the idea of "New Ways of Working", a phrase coined by Francis Duffy in his book "The New Office" where offices are designed with the intention of encouraging collaboration and increasing creativity, knowledge sharing, engagement and productivity.

The idea is that "chance" meetings and conversations in open-plan environments can lead to unplanned collaborations that tend to happen less frequently in more traditional cellular office or cubicle workplaces. This thinking has been widely adopted in the technology sector and beyond. According to Brad Bird, a director at Pixar, when Pixar were building their new 15,000sqm campus in 1999, Steve Jobs insisted that there would only be one toilet block, positioned in the centre of the building: *"[Jobs] realized that when people run into each other, when they make eye contact, things happen. So he made*

*it impossible for you not to run into the rest of the company"* (Bird, 2008).

The design of work environments for collaboration is now seen as a key contributing factor to business success. According to the Gensler 2008 Workplace Survey, *"Top-Performing companies spend 23 per cent more time collaborating than average companies and consider collaboration more than twice as critical to job success"* (Gensler, 2008, p.12). The design of spaces that encourage collaboration has been widely adopted beyond the technology sector. According to Paul Pegler, of Her Majesty's Treasury (UK), as part of the Treasury's redevelopment project (2003) *"more than seven miles of internal walls were removed.... This physical change was symbolic of much deeper cultural, business and technology transformation within the Treasury, where numerous time-bound organisational barriers were removed to support the more agile and dynamic organisation that is evolving today"* (Allen, 2004, p. 12).

The workplace has also seen a clear movement towards the idea of the "bench" and "agile" spaces that can adapt to different

tasks, staff numbers and needs. The concept behind the bench is very simple, and is based upon a large table, where anything that defines territory or impedes collaboration, such as legs, vertical supports, fixed side screens, are removed or minimised in order to create an uninterrupted, large work surface for any task from meetings, to paper work, to laptop use (Figure 3/4).

### Workplace Survey

While several studies have been undertaken in this general area of open-plan office design and the impact on concentration and communication, they are frequently narrow in focus and very technical or undertaken with a Facilities Management as opposed to Design standpoint. Shafagh et al. (2014) summarise findings from 27 related articles on Open Plan Office Design, though some are reasonably dated when considered from a design point of view.

This survey is a starting point for what is hoped will grow into a larger research project into workplace design. It generally looks at how different office types affect concentration, privacy, exchange of information and so on and asks if there a variance in experience of open-plan within different age categories, industry sectors and job types. Furthermore, it looks at how important an issue workplace design really is for staff.

The survey was circulated by email to a broad audience, though there is a slight bias towards the design/ creative sector. The survey was purposely kept brief and simple in order to attract a reasonable level of response and to act as a foundation for further studies.

### General findings

Overall, there were 150 respondents from a range of industries including IT/ Software/ Technology/ Engineering or similar (21 per cent of responses), Financial Services/ Banking or similar (14 per cent), Design/ Architecture/ Creative/ Media or Similar (28 per cent), Education/ Research (9 per cent), Public Sector, Government or Similar (28 per cent). Nearly all participants could be defined as “knowledge workers”.

In terms of age balance there was an imbalance towards the 35-44 category which accounted for 50 per cent of

responses. The level of response in the 20-34 and 45-55 age categories were 22 per cent and 20 per cent respectively, with the 55+ category at 7 per cent.

65 per cent of respondents worked in open-plan, of which 33 per cent in shared spaces with 5-24 colleagues, 10 per cent with 25-39 colleagues and 22 per cent with 40+ colleagues. 18 per cent worked in private offices and 17 per cent in offices with 2-4 colleagues. Of those polled, only 5 per cent “hot-desk” full-time while 10 per cent work from home on a regular basis.

### Concentration and Focus, Privacy and Personal Space

Filtering the survey to take into account only those who work in open-plan, the study generally supports some of the commentary and research mentioned previously. When asked how the design of their office affected their ability to focus and concentrate, overall 9 per cent answered “very negatively” while 54 per cent of respondents answered “negatively”. 12 per cent and 6 per cent answered “positively” or “very positively” respectively. Across age categories there were noticeable differences; 5 per cent of the 20-34 age category answered “very negatively” as did 9 per cent of the 35-44 category and 17 per cent of the 45-54 category. From this data, it could be suggested that younger respondents appear to have less problems concentrating and focusing in open-plan spaces. There may be many reasons for this and it may provide an interesting topic for further study.

There were more significant differences when the results were filtered by industry sector with 43 per cent the IT/ Software/ Technology/ Engineering category responding either “negatively” or “very negatively” compared to 56 per cent of the Design/ Architecture/ Creative/ Media, 67 per cent of Education/ Research, 78 per cent of Financial Services/ Banking and 80 per cent of Public Sector/ Government respondents. If it is assumed that work such as programming and engineering requires reasonably high levels of concentration that are somewhat in-line with some of the other sectors, it could be suggested that companies in these areas have responded to these issues more proactively than the other sectors. Companies in the Software and Technology tend to be at the forefront of office design

and invest heavily in design and fit-out. This is particularly true for large corporates like Google, Facebook and LinkedIn who actively compete with each other on their workplace facilities. The age profile of employees at these organisations may also be a contributing factor. The results also align with the view that more traditional types of organisation such as Banking and the Public Sector may be slower to respond to more innovative practices.

The survey also asked how the design of their office affected their sense of privacy/ personal space. The results were somewhat similar to the above – overall 50 per cent of respondents felt “negative” or “very negative”.

As may be expected, 23 per cent and 54 per cent of respondents who worked in private offices responded “positively” and “very positively” in relation to their ability to concentrate/ focus, however, responses from those in small shared offices (with 2-4 people) were much more closely aligned with those of larger open plan spaces.

## Collaboration, Team Cohesion, Knowledge Sharing and Social Aspects

Respondents were asked to rate how the design of their office affects them in relation to a number of issues including collaboration with others, social aspects of work, team building and relationship development, knowledge sharing and exchange of information.

When the results were filtered to take only responses from those in open-plan spaces, in relation to how the design of their office affected their collaboration with others, 53 per cent and 27 per cent responded “positively” and “very positively” respectively, with only 3 per cent responding negatively. The responses to similar questions on Team Cohesion, Knowledge Sharing and Social Aspects of Work were broadly in-line with these results.

Conversely, 15 per cent of those in private offices answered “negatively” on the question of collaboration, 30 per cent negatively or very negatively on the “social aspects” of work, and 19 per cent negatively on the knowledge sharing question. These results appear to strongly support the idea that open-plan offices work well in

respect to activities that involve interaction with others while private offices appear to be less effective.

## Public versus Private Spaces

When asked to rate whether their workplace has multiple spaces for formal meetings, casual meetings, team work and so on, 36 per cent of respondents answered negatively. By comparison, when asked whether their workplace had spaces to work quietly, 67 per cent of respondents answered negatively. This could be looked on as a strategic bias towards collaboration but may also be that designers and companies, in an effort to make an impactful design statement, neglect less visible and less exciting spaces such as quiet rooms in favour of more exciting public amenities.

## Overall Productivity

When asked how the design of their office affected their overall productivity, 4 per cent and 16 per cent of those in open-plan responded “negatively” and “very negatively” compared with only 4 per cent of those in private offices responding “negatively”. While this shows a clear percentage difference between levels of satisfaction in private offices and open-plan, it should be noted that the results for open plan were positive overall; 5 per cent and 43 per cent answered “very positively” and “positively” in relation to the impact of their office design on productivity.

## The importance of design

The survey also questioned the importance of design to office workers. When asked to rate the statement that “*having a well-designed workplace (aesthetically and functionally) makes or would make me more productive*” 48 and 41 per cent “agreed” and “strongly agreed” respectively. The survey recorded similar responses to a question on feeling valued as an employee and feeling positive about their work.

In relation to the statement “*The design of the workplace influenced my choice in working here*”, 14 per cent “agreed” with 4 per cent “strongly agreeing”. The results varied when filtered across categories, for example 14 per cent and 10 per cent of those in the IT/ Software/ Technology/ Engineering category “agreeing” and “strongly agreeing” respectively. This is a significant statistic, particularly in sectors such as IT/ Software



where competition to get and retain the best employees is fierce.

#### Introverts versus Extroverts

According to Susan Cain, writing in the New York Times, workplaces tend to be designed for extroverts who are happy to work in open plan spaces with plenty of interaction with others, while the needs of introverts are ignored. *Solitude is out of fashion. Our companies, our schools and our culture are in thrall to an idea I call the New Groupthink, which holds that creativity and achievement come from an oddly gregarious place. Most of us now work in teams, in offices without walls, for managers who prize people skills above all. Lone geniuses are out. Collaboration is in* (Cain, 2012).

As a last question this survey asked respondents whether they considered themselves to be “mostly introvert”, “mostly extrovert” or “somewhere in between”. The results endorse Cain’s piece; of 14 respondents working in open-plan who classed themselves as “mostly introvert”, 21 per cent and 50 per cent answered “very negatively” and “negatively” respectively to the question on how the design of their office affected their ability to concentrate. This compares to 6 and 42 per cent respectively for those who classed themselves as “mostly extrovert” (31 respondents). Furthermore, 26 per cent of extroverts reported positive effects on concentration compared to zero percent of introverts in the same question.

#### Conclusion, recommendations and further work

While the survey has some deficiencies in terms of sample size and demographic, it generally aligns with other research and gives a balanced and broad overview of the subject area. By looking at age, industry type and personality type it provides additional insights to those that are readily available. Taking into account the results of this survey combined with the findings and commentary discussed earlier, the following conclusions could be made.

There are problems relating to the design of many open-plan workplaces, particularly in relation to how they facilitate work that requires concentration and focus. Conversely, the results show that open-plan have positive effects on collaboration, knowledge

sharing, team work and the social aspects of work- factors that should not be forgotten in the backlash against the open office.

When the survey was filtered to show only responses from those who work in open-plan but answered positively in relation to having additional spaces where they can work quietly, responses to all questions were substantially more positive. The best workplaces provide not only amenities for collaboration of combination of personal space and shared amenities to provide suitable solutions for different work modes including concentration and focus. This is backed up by the Gensler report which concludes: “Workplaces designed to enable collaboration without sacrificing employee’s ability to focus are more successful” (Gensler, 2013, p. 6)

Finally, design is important; respondents overwhelmingly agreed with statements relating to the importance of good workplace design and its impact on productivity and morale.

It is hoped that this work will provide a foundation for further research, both academic and practice based, which will include further studies, surveys, case studies as well as test modelling, spatial mock-ups and trial installations.

Figure 5:  
Ongoing research

